Amend claim 38 to depend from claim 36 only.

Amend claims 41-43 to depend from claim 39 only.

Amend claim 44 by deleting in part (a) "any one of claims 39 to 41" and inserting -claim 39- therefor.

Amend claim 46 by deleting in part (a) "any one of claims 39 to 41" and inserting -claim 39- therefor.

Amend claim 48 by deleting "according to any one of claims 33 to 34" in the second line of the claim and inserting -selected from the group consisting of: SEQ. ID. Nos.: 1-7- therefor.

Amend claim 49 by deleting "47 or 48" in the first line of the claim and inserting -47- therefor.

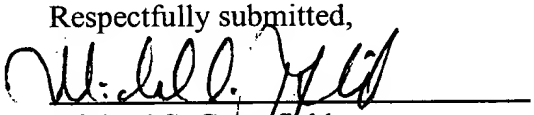
Amend claim 49 by deleting "according to any one of claims 34 to 35" bridging the second and third lines of the claims and insert -having at least 85% homology to a polynucleotide sequence selected from the group consisting of SEQ. ID. Nos.: 1-7- therefor.

REMARKS

The foregoing amendments to the afore-mentioned claims remove multiple dependencies to reduce the cost of filing. Enclosed herewith are the complete amended claims set and a redline version.

If there are any questions or comments regarding this Preliminary Amendment or application, the Examiner is encouraged to contact the undersigned attorney as indicated below.

Respectfully submitted,



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Redline Claims for U.S. National Phase of PCT/AU00/00805

1. A vaccine for the prevention of lactic acidosis in a vertebrate, said vaccine comprising at least one isolated microorganism, or fragment or fragments thereof, wherein said microorganism is capable of producing lactic acid within the gut of said vertebrate, and wherein said microorganism is selected from the group consisting of: *Clostridium*-like species, *Prevotella*-like species. *Bacteroides*-like species, *Enterocccus*-like species, *Selenomonas* species, non-dextran slime producing *Streptococcus* species and non-slime producing lactic acid batrerial isolates.

2. The vaccine of claim 1, wherein the microorganism is selected from the group consisting of: *Streptococcus equinus*, *Clostridium*-like *vitulinus*, *Selenomonas ruminantium*, *Prevotella*-like species, *Bacteroides*-like species, *Enterococcus*-like species. *Streptoccus bovis* SbR1 and non-slime producing lactic acid bacterial isolates LAB02, LAB06 and LAB08.

3. (Amended)The vaccine of claim 1~~ or 2~~, wherein the microorganism is selected from the group consisting of: *Streptococcus bovis* (SbR1) (NM99/04455), *Streptococcus equinus* (SER1) (NM99/04456); *Streptococcus equinus* (SER2) (NM99/04457); *Selenomonas ruminantium* (SRR1) (NM99/04458); *Selenomonas ruminantium* (SRR3) (NM99/04460): *Clostridium*-like *vitulinus* (LVR3) (NM99/04461); *Clostridium*-like *vitulinus* (LVR4) (NM99/04462), *Prevotella*-like isolates LAB01 (NM00/12630) and LAB03 (NM00/12632), *Bacteroides*-like isolate LAB07 (NM00/12636), *Enterococcus*-like isolate LAB05 (NM00/12634), *Streptococcus bovis* (SbR1), non-dextran slime producing *Streptococcus* isolate LAB04 (NM00/12633) and non-slime producing lactic acid bacterial isolates LAB02 (NM00/12631), LAB06 (NM00/12635) and LAB08 (NM00/12637).

4. (Amended)The vaccine of~~ any one of~~ claim~~s~~ 1~~ to 3~~, wherein the vertebrate is selected from the group consisting of a monogastric, herbivore, human or ruminant animal.

5. (Amended)The vaccine of ~~any one of~~ claims 1 ~~to 4~~, wherein said vaccine comprises live or dead intact cells of at least one of said microorganisms.

6. (Amended)The vaccine of ~~any one of~~ claims 1 ~~to 4~~, wherein said vaccine comprises outer membrane and associated proteins of at least one of said microorganisms.

7. (Amended)The vaccine of ~~any one of~~ claims 1 ~~to 6~~, wherein the fragment or fragments of the microorganism is present in the vaccine as an immunogenic polypeptide, glycopeptide or the like.

8. (Amended)The vaccine of ~~any one of~~ claims 1 ~~to 7~~, wherein the vaccine is formulated for administration via intramuscular, subcutaneous, inhalation, topical or other parenteral route.

9. A pharmaceutical composition for the prevention of lactic acidosis in a vertebrate comprising at least one isolated microorganism capable of producing lactic acid within the gut of a vertebrate, or fragment or fragments thereof, wherein said microorganism is selected from the group consisting of: *Clostridium*-like species, *Prevotella*-like species *Bacteroides*-like species, *Enterococcus*-like species, *Selenomonas* species, non-dextran slime producing *Streptococcus* species and non-slime producing lactic acid bacterial isolates, together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

10. The pharmaceutical composition of claim 9, wherein the microorganism is selected from the group consisting of: *Streptococcus equinus*, *Clostridium*-like *vitulinus*, *Selenomonas ruminantium*, *Prevotella*-like species. *Bacteroides*-like species, *Enterococcus*-like species, *Streptococcus bovis* SbR1 and non-slime producing lactic acid bacterial isolates LAB02, LAB06 and LAB08.

11. (Amended)The pharmaceutical composition of claim 9 ~~or 10~~, wherein the miroorganism is selected from the group consisting of: *Streptococcus bovis* (SbR1) (NM99/04455), *Streptococcus*

equinus (SER1) (NM99/04456); *Streptococcus equinus* (SER2) (NM99/04457); *Selenomonas ruminantium* (SRR1) (NM99/04458); *Selenomonas ruminantium* (SRR3) (NM99/04460); *Clostridium*-like *vitulinus* (LVR3) (NM99/04461); *Clostridium*-like *vitulinus* (LVR4) (NM99/04462), *Prevotella*-like isolates LAB01 (NM00/12630) and LAB03 (NM00/12632), *Bacteroides*-like isolate LAB07 (NM00/12636), *Enterococcus*-like isolate LAB05 (NM00/12634). *Streptococcus bovis* (SbR1), non-dextran slime producing *Streptococcus* isolates LAB04 (NM00/12633), and non-slime producing lactic acid bacterial isolates LAB02 (NM00/12631), LAB06 (NM00/12635) and LAB08 (NM00/12637).

12. (Amended)The pharmaceutical composition according to ~~any one of~~ claims ~~9 to 11~~, wherein the microorganism is provided as live cells, attenuated cells, killed whole cells, cell lysate, crude antigen mixture or purified antigen or antigens from the microorganism.

13. (Amended)The pharmaceutical composition according to ~~any one of~~ claims ~~9 to 12~~, wherein the microorganism, and/or fragment or fragments thereof, is present as outer membrane and associated proteins of said microorganism.

14. (Amended)The pharmaceutical composition according to ~~any one of~~ claims ~~9 to 13~~, wherein the fragment or fragments of the microorganism is present as an immunogenic polypeptide or glycopeptide, or the like.

15. (Amended)The pharmaceutical composition according to ~~any one of~~ claims ~~9 to 14~~, further comprising at least one cytokine.

16. (Amended)A method for inducing an immune response against lactic acidosis in a vertebrate, comprising administering to said vertebrate an immunologically effective amount of the vaccine in accordance with ~~any one of claims 1 to 8~~ claim 1, or a pharmaceutical composition in accordance with ~~any one of claims 10 to 15~~ claim 10.

17. A method according to claim 16, further comprising administering at least one cytokine.

18. (Amended)A method for inducing an immune response against lactic acidosis in a vertebrate, comprising administering to said vertebrate an immunologically effective amount of the vaccine according to ~~any one of claims 1 to 8~~ claim 1.

19. (Amended)A method for the treatment and/or prophylaxis of lactic acidosis in a vertebrate in need of said treatment and/or prophylaxis, wherein said method comprises administering to said vertebrate a therapeutically effective amount of the vaccine in accordance with ~~any one of~~ claims 1 ~~to 8~~, or a pharmaceutical composition in accordance with ~~any one of claims 10 to 15~~ claim 10.

20. The method of claim 19, wherein said method further comprises the administration of an active agent.

21. A method for the treatment and/or prophylaxis of lactic acidosis in a vertebrate in need of said treatment and/or prophylaxis, wherein said method comprises administering to said vertebrate a therapeutically effective amount of an active agent capable of preventing or controlling lactic acid accumulation in the gut of a vertebrate, and wherein said lactic acid is produced by at least one microorganism selected from the group consisting of: *Clostridium*-like species, *Prevotella*-like species, *Bacteroides*-like species, *Enterococcus*-like species, *Selenomonas* species, non-dextran slime producing *Streptococcus* species and non-slime producing lactic acid bacterial isolates.

22. The method of claim 21, wherein the microorganism is selected from the group consisting of: *Streptococcus equinus*, *Clostridium*-like *vitulinus*, *Selenomonas ruminantium*, *Prevotella*-like species, *Bacteroides*-like species, *Enterococcus*-like species. *Streptococcus bovis* SbR1 and non-slime producing lactic acid bacterial isolates LAB02, LAB06 and LAB08.

23. (Amended)The method of claim 21 ~~or 22~~, wherein said microorganism is selected from the group consisting of: *Streptococcus bovis* (SbR1) (NM99/04455), *Streptococcus equinus* (SER1)

(NM99/04456); *Streptococcus equinus* (SER2) (NM99/04457); *Selenomonas ruminantium* (SRR1) (NM99/04458); *Selenomonas ruminantium* (SRR3) (NM99/04460): *Clostridium*-like *vitulinus* (LVR3) (NM99/04461); *Clostridium*-like *vitulinus* (LVR4) (NM99/04462), *Prevotella*-like isolates LAB01 (NM00/12630) and LAB03 (NM00/12632), *Bacteroides*-like isolate LAB07 (NM00/12636), *Enterococcus*-like isolate LAB05 (NM00/12634), *Streptococcus bovis* (SbR1), non-dextran slime producing *Streptococcus* isolate LAB04 (NM00/12633) and non-slime producing lactic acid bacterial isolates LAB02 (NM00/12631), LAB06 (NM00/12635) and LAB08 (NM00/12637).

24. (Amended)The method of ~~any one of~~ claims 19 ~~to 23~~, wherein the active agent is used in conjunction with a vaccine according to ~~any one of~~ claims 1 to 8.

25. (Amended)The method of ~~any one of~~ claims 19 ~~to 24~~, wherein the active agent is selected from the group consisting of: antibiotics, enzyme preparations, clay preparations, compounds which slow the digesta flow, prebiotics and probiotics.

26. The method of claim 25, wherein the antibiotic is active against gram-positive lactic acid producing microorganisms.

27. The method of claim 25, wherein the enzyme preparation is active against lactic acid producing gram-negative bacteria.

28. The method of claim 25, wherein the clay preparation is active against lactic acid producing Gram-negative or Gram positive bacteria.

29. The method of claim 25, wherein the compounds which slow digesta flow rate are indirectly active against lactic acid producing gram-negative bacteria.

30. The method of claim 29, wherein the compounds which slow digesta flow rate are selected from the group consisting of biologically active peptides (BAP), compounds active on the

autonomic nervous system, 5HT agonists/antagonists, motilin antagonists, NO promoters, and dopamine.

31. The method of claim 25, wherein the probiotic preparations include bacteria selected from the group consisting of: *Megasphera*, *Veillenolla*, *Selenomonas*, *Propionibacterium*, *Anaerovibrio* and *Peptococcus*.

32. The method of claim 31, wherein the probiotic preparations include yeast and mycelial preparations capable of utilising lactic acid, and converting lactic acid to volatile fatty acids and other end products.

33. An isolated nucleic acid molecule comprising a polynucleotide sequence selected from the group consisting of: SEQ ID Nos. 1-7.

34. A nucleic acid molecule analogue of the polynucleotide sequence of claim 33, wherein said analogue has at least 85% homology to said polynucleotide sequence.

35. (Amended)A nucleic acid molecule oligonucleotide fragment of the polynucleotide sequence according to claim 33~~ or 34~~.

36. (Amended)A vector comprising the nucleic acid molecule according to any one of claims 33~~ to 35~~.

37. The vector of claim 36, wherein the vector is selected from the group consisting of: viral, plasmid, bacteriophage, phagemid, cosmid, bacterial artificial chromosome, and yeast artificial chromosome.

38. (Amended)A host cell transformed with the vector of claim 36~~ or claim 37~~.

39. An antibody raised against at least one lactic acid producing microorganism, wherein said microorganism is selected from the group consisting of: *Clostridium*-like species. *Prevotella*-like

species, *Bacteroides*-like species. *Enterococcus*-like species, *Selenomonas* species, non-dextran slime producing *Streptococcus* species and non-slime producing lactic acid bacterial isolates.

40. The antibody of claim 39, wherein the microorganism is selected from the group consisting of: *Streptococcus equinus*, *Clostridium*-like *vitulinus*, *Selenomonas reminantium*, *Prevotella*-like species, *Bacteroides*-like species, *Enterococcus*-like species, *Streptococcus bovis* SbR1 and non-slime producing lactic acid bacterial isolates LAB02, LAB06 and LAB08.

41. (Amended)The antibody of claim 39 ~~or 40~~, wherein said microorganism is selected from the group consisting of: *Streptococcus bovis* (SbR1) (NM99/04455), *Streptococcus equinus* (SER1) (NM99/04456); *Streptococcus equinus* (SER2) (NM99/04457); *Selenomonas ruminantium* (SRR1) (NM99/04458); *Selenomonas ruminantium* (SRR3) (NM99/04460); *Clostridium*-like *vitulinus* (LVR3) (NM99/04461); *Clostridium*-like *vitulinus* (LVR4) (NM99/04462), *Prevotella*-like isolates LAB01 (NM00/12630) and LAB03 (NM00/12632), *Bacteroides*-like isolate LAB07 (NM00/12636), *Enterococcus*-like isolate LAB05 (NM00/12634), *Streptococcus bovis* (SbR1), non-dextran slime producing isolate LAB04 (NM00/12633) and non-slime producing lactic acid bacterial isolates LAB02 (NM00/12631), LAB06 (NM0012/635) and LAB08 (NM00/12637).

42. (Amended)A vaccine comprising at least one antibody according to ~~any one of~~ claims 39 ~~to 41~~, together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

43. (Amended)A diagnostic kit for the detection of microorganisms having a role in lactic acidosis in a vertebrate, said kit comprising at least one antibody according to ~~any one of~~ claims 39 ~~to 41~~, together with a diagnostically acceptable carrier and/or diluent.

44. (Amended)The diagnostic kit of claim 43 comprising:

(a) a first container containing at least the antibody (or fragment thereof) according to ~~any one of claims 39 to 41~~ claim 39, and;

(b) a second container containing a conjugate comprising a binding partner of the antibody (or fragment thereof), together with a detectable label.

45. The diagnostic kit of claim 44, wherein said first container further contains antibodies selected from the group consisting of: antibodies capable of detecting at least one lactic acid producing strain selected from *Streptococcus bovis* or lactobacilli and antibodies capable of detecting *Streptococcus bovis* (strain Sb-5).

46. A method for screening for the presence of microorganisms having a role in acidosis in a vertebrate comprising:

(a) contacting a sample from the gut of a vertebrate with the antibody (or fragment thereof) according to ~~any one of claims 39 to 41~~ claim 39, and

(b) detecting the presence of the antibody (or fragment thereof) bound to microorganisms having a role in acidosis.

47. A method for screening for the presence of microorganisms having a role in acidosis in a vertebrate comprising:

(a) contacting a nucleic acid sample from a microorganism is selected from the group consisting of: *Clostridium*-like species, *Prevotella*-like species, *Bacteroides*-like species, *Enterococcus*-like species, *Selenomonas* species, non-dexran slime producing *Streptococcus* species and non-slime producing lactic acid bacterial isolates, and

(b) detecting hybridisation between the nucleic acid sample and the probe sequence.

48. (Amended)The method of claim 47 wherein the nucleic acid probe corresponds to a portion of at least one of the polynucleotide sequences ~~according to any one of claims 33 to 34~~ selected from the group consisting of: SEQ. ID. Nos.: 1-7, which is capable of selectively hybridising to nucleic acid from a sample.

49. (Amended)The method of claim ~~47 and 48~~ 47, wherein the nucleic acid probe corresponds to a probe mix, comprising a portion of the polynucleotide sequence ~~according to any one of claims 34 to 35~~ having at least 85% homology to a polynucleotide sequence selected from the group consisting of SEQ. ID. Nos.: 1-7 which is capable of selectively hybridising to nucleic acid from a sample, together with an isolated nucleic acid molecule comprising a polynucleotide sequence capable of selectively hybridising to the nucleic acid (or portion thereof) of at least one lactic acid producing strain selected from *Streptococcus bovis* or lactobacilli, or a polynucleotide sequence capable of selectively hybridising to the nucleic acid (or portion thereof) of the microorganism strain *Streptococcus bovis* (strain Sb-5).

50. A method for screening for potential therapeutic agents for the treatment of lactic acidosis in a vertebrate, said method comprising

(a) contacting the potential therapeutic agent with a microorganism selected from the group consisting of: *Clostridium*-like species, *Prevotella*-like species, *Bacteroides*-like species, *Enterococcus*-like species, *Selenomonas* species, non-dextran slime producing *Streptococcus* species and non-slime producing lactic acid bacterial isolates, and

(b) detecting an effect of the therapeutic agent on said microorganism.

51. The method of claim 50, wherein said therapeutic agent alters the lactic acid production pathway in at least one of said microorganisms.

52. An isolated culture of at least one microorganism selected from the group consisting of: *Streptococcus bovis* (SbR1) (NM99/04455), *Streptococcus equinus* (SER1) (NM99/04456); *Streptococcus equinus* (SER2) (NM99/04457); *Selenomonas ruminantium* (SRR1) (NM99/04458); *Selenomonas ruminantium* (SRR3) (NM99/04460); *Clostridium*-like *vitulinus* (LVR3) (NM99/04461); *Clostridium*-like *vitulinus* (LVR4) (NM99/04462), *Prevotella*-like isolates LAB01

(NM00/12630) and LAB03 (NM00/12632), *Bacteroides*-like isolate LAB07 (NM00/12636), *Enterococcus*-like isolate LAB05 (NM00/12634), *Streptococcus bovis* (SbR1), non-dextran slime producing *Streptococcus* isolate LAB04 (NM00/12633) and non-slime producing lactic acid bacterial isolates LAB02 (NM00/12631), LAB06 (NM00/12635) and LAB08 (NM00/12637).